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[54] **PATTERN PRINTING CEMENTERS**

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[51] **Int. Cl.**[3] **B05C 1/02;** B05C 13/02

[52] **U.S. Cl.** **118/50;** 118/212; 118/243

[58] **Field of Search** 118/243, 263, 238, 253, 118/421, 50, 211, 212

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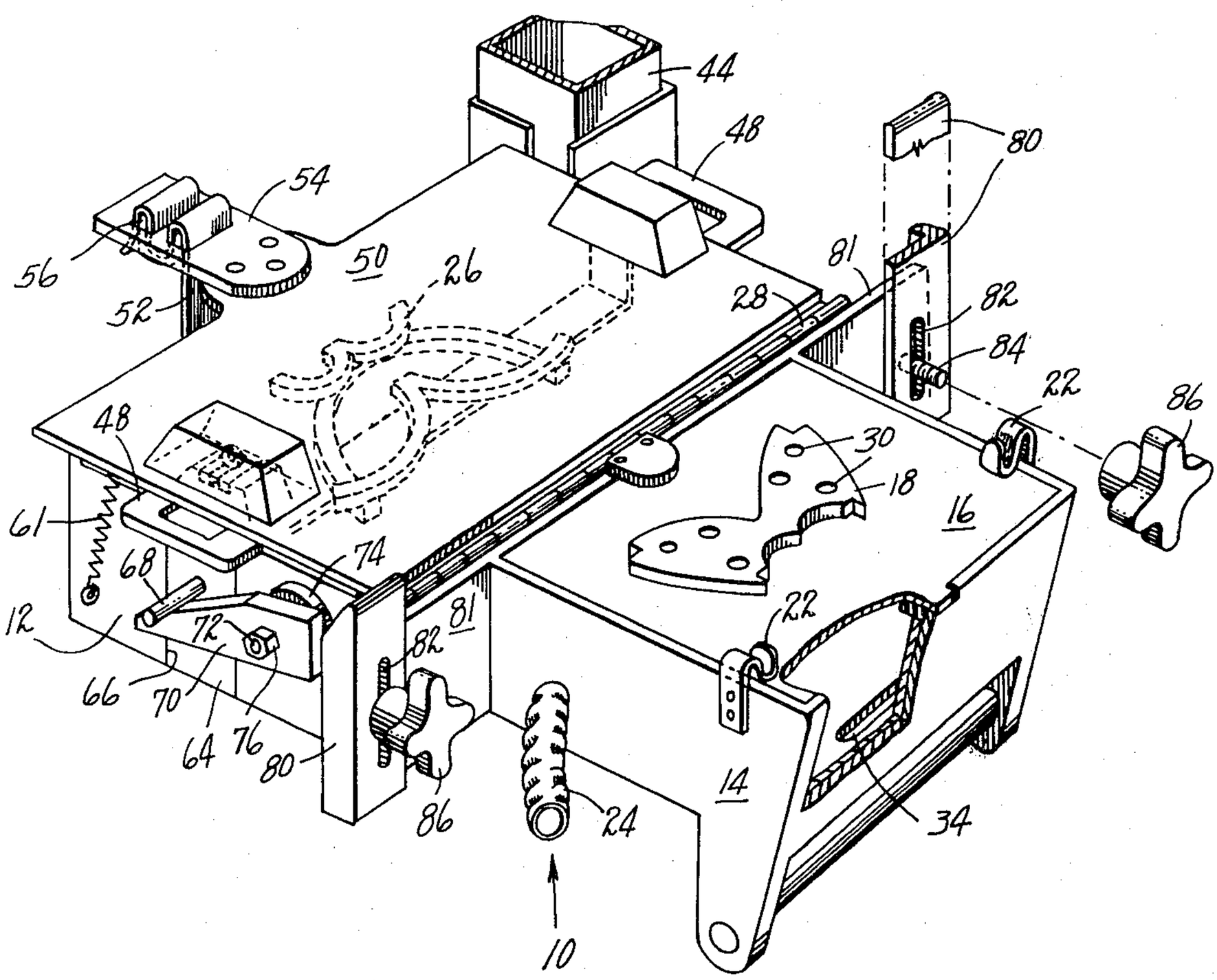
[57] **ABSTRACT**

There is disclosed in the present application a cementing apparatus in which a pattern of cement is imprinted upon a part by an imprinting plate which, between imprinting operations, is submerged in a reservoir of cement. A part support, which cooperates with the plate, is shaped to receive the part or workpiece and is movable between loading and imprinting positions. The workpiece is retained by vacuum on the work support and is carried by it into contact with the plate, maintaining register so that the cement pattern is applied in a predetermined position on the workpiece.

10 Claims, 5 Drawing Figures



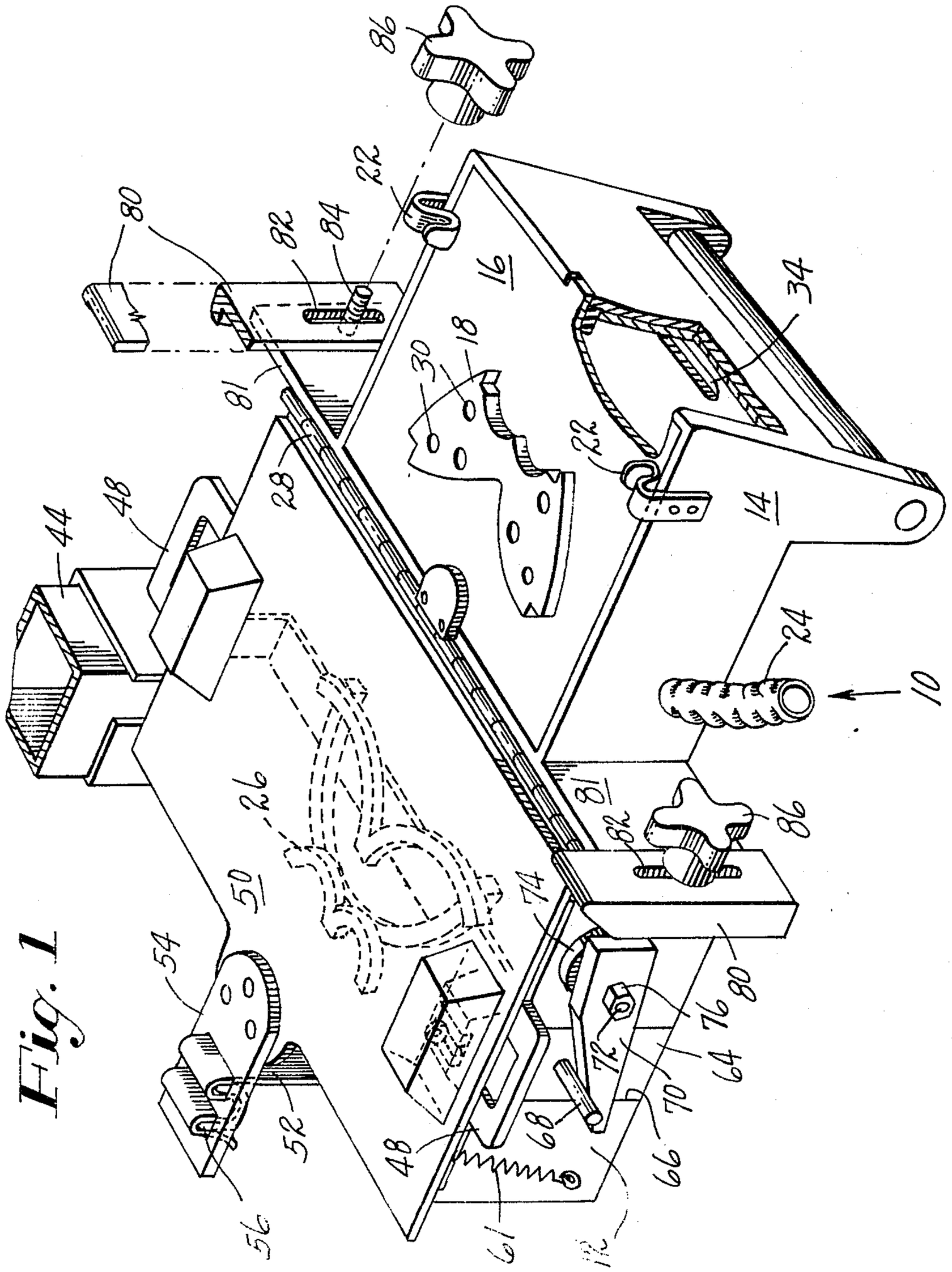

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Fig. 1

Fig. 2

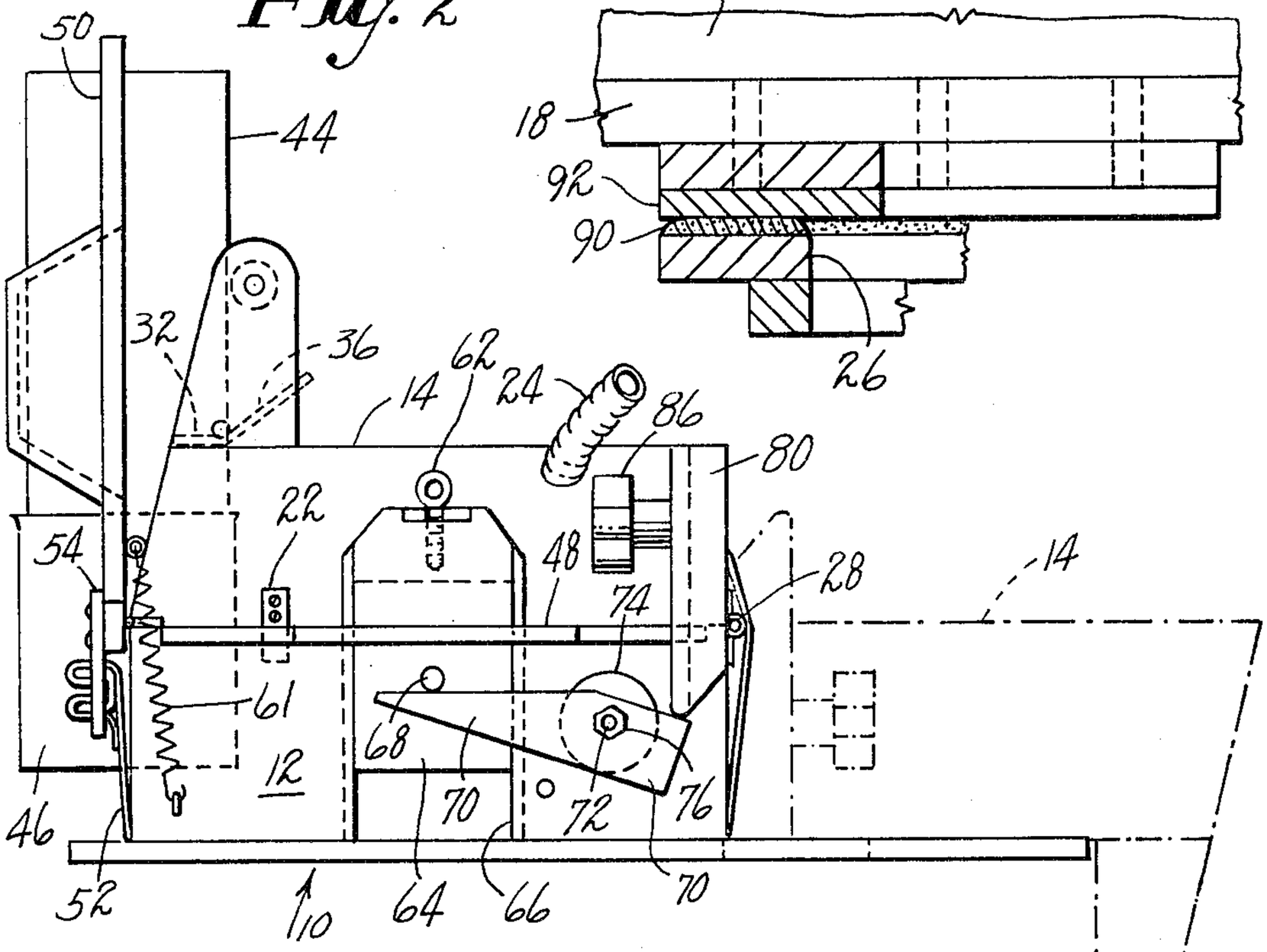


Fig. 5

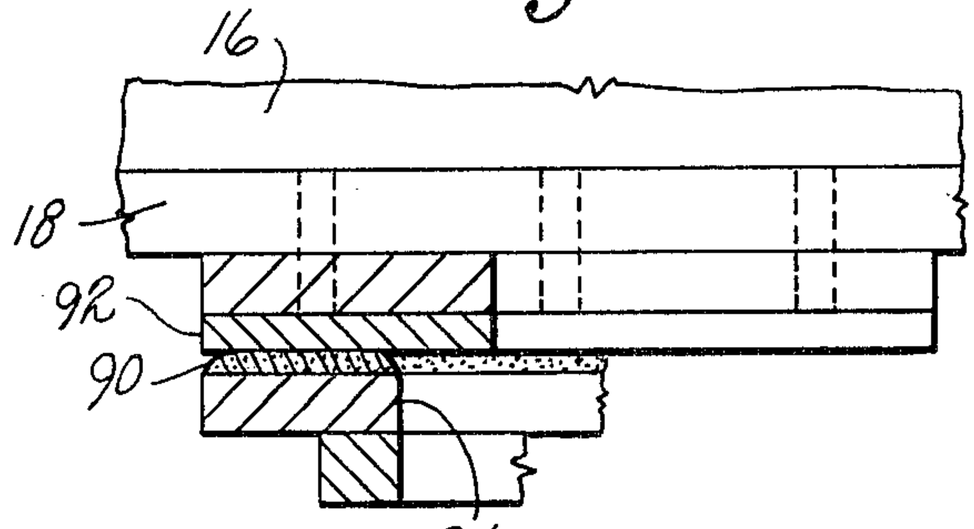
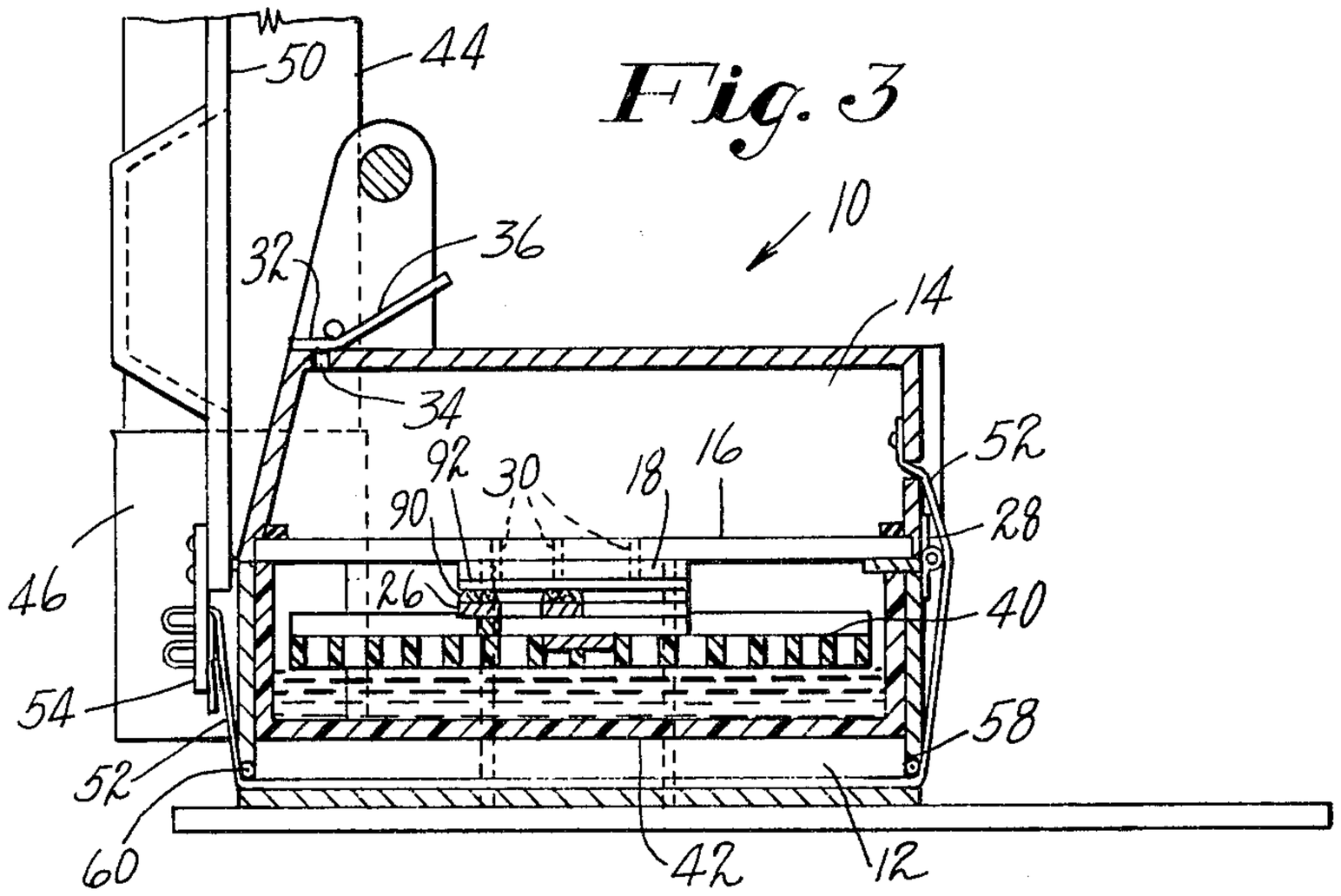


Fig. 3



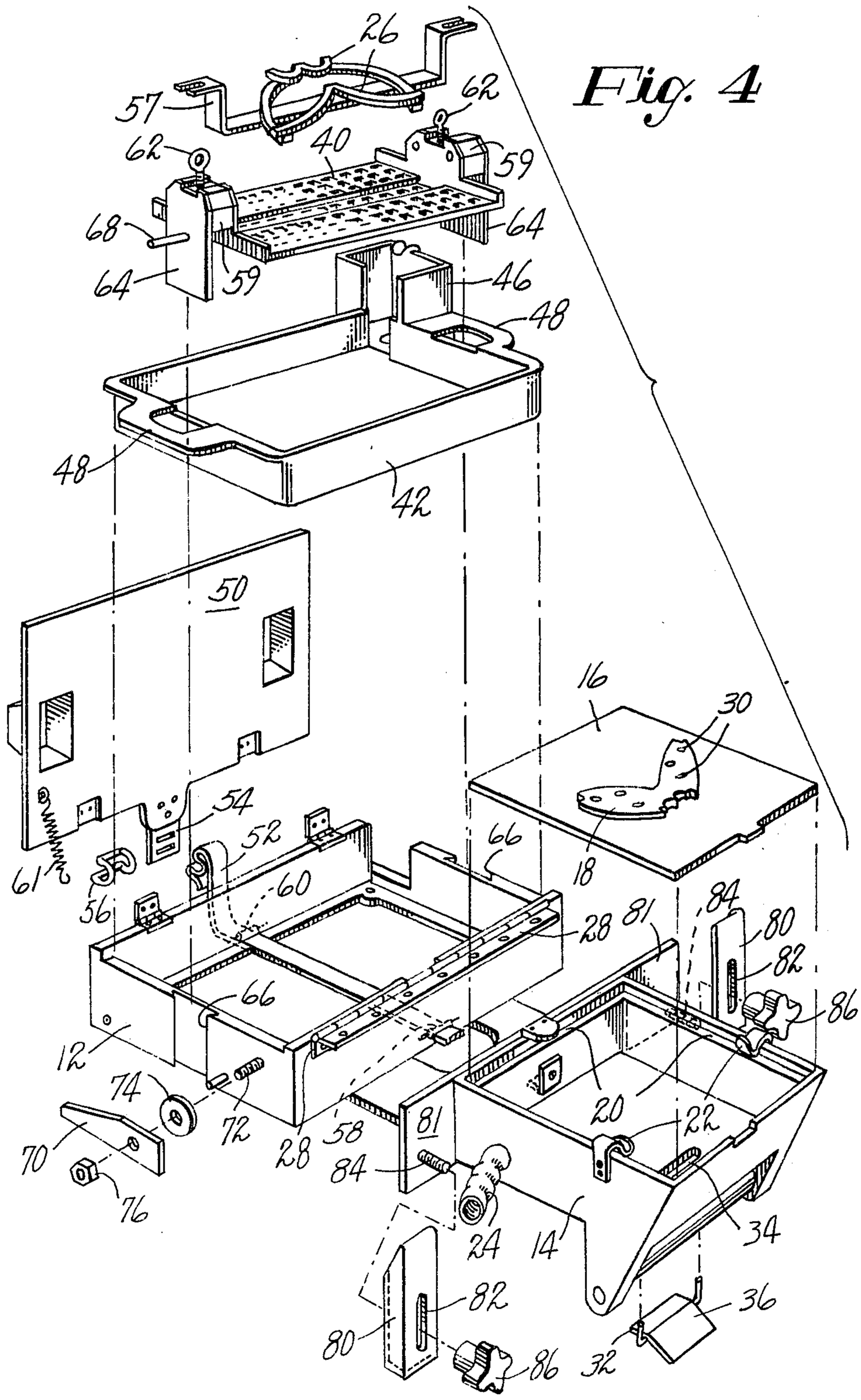

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Fig. 4

PATTERN PRINTING CEMENTERS

The present application relates generally to improvements in pattern cementing apparatus and more particularly to such apparatus in which the pattern of cement is applied by an imprinting element or plate.

In the manufacture of such articles as shoes, wallets, handbags and the like, many parts include areas which must be coated with cement as a step preliminary to edge folding without a seam and sometimes with a seam. The locally applied cement must be placed with a certain degree of precision since cement left on exterior surfaces of finished articles must either be removed with the expenditure of considerable labor or the article must be downgraded because of the defect. Conventional methods of applying cement locally are either by brush or spray, guided eifree hand or with a stencil. In either case, however, the process is inefficient, inaccurate and wasteful of both materials and labor.

It is accordingly an object of the present invention to improve both the economy and accuracy attending the application of cement to parts of various articles.

Another object is to increase the productivity of cementing operations at the same time that the skill required for performing the operation is reduced.

A further object is to provide greater economy in the use of materials in cementing operations.

The foregoing objects are achieved according to the present invention by a cementing apparatus in which a feature relates to a combination of a work support which locates the workpiece or part and a cement imprinting plate. The work support is movable between loading and imprinting positions. The work support receives the workpiece in its loading position and serves as a target which establishes the proper relative placement between the workpiece, held by vacuum on the support, and the imprinting plate so that the cement imprint is applied in the desired position with relation to the contour of the workpiece. The location of the cement imprint on the workpiece is obtained by locating the printing pattern on the plate in register with the work support while the work support is in the imprinting position.

According to another feature of the invention, the plate is submerged in a reservoir of cement between imprintings and is thus kept free of dried cement accumulations which interfere with the production of an accurate imprint. According to a related feature, the reservoir and plate are covered with a movable lid while no imprinting is being performed. The lid prevents the introduction of foreign matter and dust into the cement reservoir and also somewhat reduces the tendency of the upper surface of the cement reservoir to form a dried skin. Another benefit derived from the presence of the lid is the maintenance of the viscosity of the cement which effects the imprinting process as will later be seen.

The foregoing objects, features and numerous advantages flowing from the present invention will be more fully understood from the following detailed description of an illustrative embodiment taken in connection with the accompanying drawings on which:

FIG. **1** is a view in perspective taken from the left front and showing a cementing apparatus according to the present invention;

FIG. **2** is a view in left side elevation of the apparatus depicted in FIG. **1**;

FIG. **3** is a view in transverse cross-section showing the apparatus of FIGS. **1** and **2** with its parts in the relative positions which they occupy at the time of imprinting a cement pattern upon a workpiece;

FIG. **4** is a view in perspective of the apparatus of the previous Figures but with the parts shown in exploded relationship for clarity; and

FIG. **5** is a detail view in cross section and on an enlarged scale showing relative positioning of a work support and an imprinting plate forming part of the present apparatus, and also showing the workpiece receiving a cement imprint from the plate.

Turning now to the drawings, particularly FIGS. **1** and **4**, there is shown a cement pattern imprinting apparatus according to the present invention and indicated generally at **10**. The apparatus **10** comprises a stationary base **12** in the form of a shallow box to the front edge of which is hingedly mounted a carrier **14**. The top of the carrier **14** is closed by a panel **16** upon which is fixedly mounted a work support **18** nested in the top of the carrier **14** where it is clamped down on a peripheral shoulder **20** by a pair of spring clips **22**. The carrier **14**, closed by the panel **16**, is connected to a source of vacuum through a hose **24** and is constructed as will later be seen to facilitate the placement of workpieces and their retention by vacuum to be brought into contact with an imprinting element or plate **26**.

The apparatus **10** is designed to be operated manually, the only external form of power required being the source of vacuum already mentioned. Manual effort is applied by the operator by simply moving the carrier from the loading position depicted in FIG. **1** to the imprinting position shown in FIG. **3**, the total motion imparted to the carrier being the pivotal motion about a hinge **28** which connects the carrier **14** to the base **12**. The work support **18** is perforated at **30** to communicate with the interior of the carrier **14** which is under vacuum through the hose **24**. A valve comprising a hinged flapper **32**, shown in FIG. **3** is positioned to cover a series of openings **34** in the body of the carrier as the carrier is raised from its loading position shown in FIG. **1**. The flapper **32** is formed with an integral upwardly extending tail **36** which, when the carrier is in the loading position of FIG. **1**, causes the openings **34** to be uncovered, thereby reducing the vacuum in the carrier and allowing the workpiece being positioned on the work support to be moved into register with the work support. As the carrier is raised from the loading position, however, the flapper **32** under the influence of the vacuum in the carrier, closes the openings **34** to provide a greater force for retaining the workpiece on the work support to carry the workpiece into engagement with the imprinting plate while the carrier is in the position of FIG. **3**.

The imprinting plate **26** is supported on a grid **40**, normally submerged in a reservoir of cement contained in a liner or tray **42** fitted to the inside of the base **12**. The tray **42** greatly facilitates the draining of cement from the present apparatus and necessary periodic cleaning prior to extended periods of non-use. For maintaining an adequate level of cement in the tray **42**, it is provided with a reserve supply of cement in a container **44** upstanding in a lateral extension **46** of the main portion of the tray and in communication with the tray. The container **44** is fitted at its lower end with a flow regulator which automatically maintains the predetermined level of cement in the tray **42**. For convenience in withdrawing the tray **42** from the base **12** either for

emptying or for cleaning, the tray is formed with a pair of outwardly extending handles **50** and for emptying the tray, the extension **46** presents an excellent pouring spout.

The top of the base **12** is closed by a lid **50** which keeps the cement reservoir covered except when cement is to be applied to a workpiece. The lid **50** is hinged to the rear of the base **12** and a mechanism is provided for raising the lid out of the way as the carrier approaches. The mechanism includes a flexible strap **52** connected between the rear wall of the carrier **14** and a rearwardly directed extension **54** of the lid **50**. The extension **54** is suitably perforated to receive the rearward end of the strap **52** and a sliding buckle **56** is provided to permit the strap to be adjusted by being drawn taut. From the rear wall of the carrier **12**, the strap **52** is guided over rollers **58** and **60** at the front and rear of the base, passing, between the rollers, in a shallow recess in the bottom of the base. Thus, when the carrier **14** is pivoted upwardly from its loading position, the strap **52** is tightened, causing the lid **50** to be raised against the force of a tension spring **61** stretched between attachment points on the lid and the base to keep the lid closed.

Mechanism is also associated with the motion of the carrier **14** for raising the plate **26** from beneath the surface of the cement. The plate **26** is mounted on a narrow positioning adapter **57** dimensioned and shaped to fit slots in the grid **40** and in the tops of spacers **59**, one secured to each end of the grid **40**. The adapter **57** is formed with outwardly directed, perforated tabs, into the perforations of which are received thumbscrews **62** entering tapped openings in the slots in the tops of the spacers **60**.

In plants where cementing operations are performed, it is a common practice to require the cementing of many parts having a wide variety of contours and requiring different cement patterns to be imprinted on them. The present arrangement already described allows great flexibility in the use of the apparatus and permits a quick changeover from one form of workpiece to another by simply replacing the adapter **58**, the plate **26**. The panel **16** and the work support **18**, which make up a matched set of accurately registered and quickly replaceable parts.

The adapter **57** carrying the plate **26** is secured to the grid **40** and these parts move together as a unit as the carrier **14** is pivoted toward the imprinting position. In its motion, the assembly comprising the plate **26** is guided by a pair of slides **64** one fixedly depending from each end of the grid **40** outside the spacers **60**. Each of the slides **64** is received in a dovetailed guideway **66** cut in one of the exterior end walls of the base **12**. For actuating the motion of the grid **40**, each of the slides **64** carries a follower pin **68** engaged by one arm of an operating lever **70** which is pivotally mounted on a stud **72** extending outwardly from the end wall of the base **12**. The stud **72** is threaded into the end wall of the base and passes loosely through a suitable opening in the lever **70**, a spacer **74** being interposed between the lever and the outside wall of the base and a nut **76** being employed to retain the lever on the stud.

For raising the grid **40** and the associated parts, each of the levers **70** is engaged by an upstanding adjustable finger **80**, mounted on a lateral extension of the rear wall of the carrier **14**. Each of the fingers **80** is of an L-shaped cross-section and is slotted at **82** to receive a threaded stud **84** on which it is clamped by a tapped hand knob **86**, the fingers being positioned to engage the levers **70** as the carrier is moving toward the imprinting position and thereby cause the grid **40** to rise out of the cement reservoir carrying the plate **26** to imprint its cement pattern upon the workpiece.

The adjustment of the fingers on the lateral extensions **81** and the corresponding height of the plate **26** in its imprinting position is important because of the manner in which the cement is applied to the workpiece in the present apparatus, as will be explained with reference to FIG. **5**. The imprinting of the cement pattern, unlike the making of an ink impression in a normal printing process carried out on a letter press, for example, is accomplished by merely touching the workpiece to the cement rather than by the application of heavy pressure to the workpiece with the imprinting instrumentality. As best seen in FIG. **5**, a quantity of cement or charge **90** has been picked up by the plate **26** from being submerged in the cement of the tray **42** and is being applied to a workpiece **92** held by the work support **18**. The charge **90** is shown exaggeratedly to retain considerable thickness with the workpiece **92** and the plate **26** having reached their closest relative positions. Although the thickness of the charge **90** is exaggerated for clarity, it will be appreciated that the height reached by the plate is adjusted through the position the fingers **80** so that the cement charge is never squeezed between the plate **26** and the workpiece. The result of squeezing the charge between the plate **26** and the workpiece is to extrude droplets onto the workpiece. The squeezing of the charge **90** is avoided by the correct relative placement of the plate **26** and of the work support **18** in their imprinting positions, achieved by the adjustment of the fingers **80**. The correct spacing between the imprinting plate **26** and the work support depends upon the thickness of the workpiece and the viscosity of the cement. It has been found that the greater the viscosity of the cement, the thicker the charge **90**. Since the thickness of the workpiece remains constant for a given run, the only variable affecting the quality of the cement impression on the workpiece is the viscosity of the cement. In order to reduce the need for correcting the viscosity of the cement at frequent intervals or to compensate for uncorrected changes, the importance of the lid **50** will be more fully appreciated.

From the accompanying drawings and from the foregoing description, numerous variations and modifications within the scope of the invention will be obvious to those of ordinary skill in the art. It is therefore not intended that the foregoing be taken as a limitation of the scope of the invention but rather that the invention be interpreted in terms of the appended claims.

Having thus disclosed our invention, what we claim as new and desire to secure by Letters Patent of the United States is:

1. Apparatus for imprinting a pattern of cement upon an irregularly shaped workpiece, comprising a base containing a quantity of cement, a work support contoured at least in part to match the contour of the workpiece and providing a target for the placement of the workpiece, an imprinting plate normally submerged in the cement and shaped to apply a pattern of cement only to a pre-determined area of the workpiece when it is raised out of the cement to an imprinting position, a carrier hinged directly upon the base and upon which the work support is mounted for movement between a loading position where the workpiece is adjustably received and an imprinting position in which the work

support is in register with the imprinting plate and in which the workpiece on the work support is brought into contact with cement carried by the imprinting plate, means coupling the carrier and the imprinting plate together for causing the imprinting plate to rise above the level of the cement as the work support pivotally approaches the imprinting position and to be submerged as the work support is returned to its loading position, and vacuum means for retaining the workpiece on the work support.

2. Apparatus according to claim **1** further comprising means for varying the vacuum at the work support to a low level at the loading position to permit the workpiece to be manually aligned on the support and to a higher level to assure retention of the workpiece on the support during an operating cycle of the apparatus after the support is moved from its loading position.

3. Apparatus according to claim **1** further characterized in that the carrier is hollow and that its shape and hinge mounting on the base cause the work receiving surface of the support to be uppermost and horizontal in its loading position and that the vacuum means is connected to the work support through the carrier.

4. Apparatus according to claim **3** further comprising a valve means on the carrier for varying the vacuum at the work support from a low level permitting the workpiece to be manually aligned on the support at the loading position to a high level for securely retaining the workpiece on the support after the support is moved from the loading position.

5. Apparatus according to claim **1** further comprising means for adjusting the spacing between the work support and the imprinting plate when both are in their imprinting positions.

6. Apparatus according to claim **1** further comprising a lid pivoted on the base and normally covering the cement and means interconnecting the lid and the carrier for raising the lid as the carrier is pivoted manually to bring the work support into its imprinting position.

7. An interchangeable sub-assembly for providing a target for an irregularly shaped workpiece and for imprinting a pattern of cement in a pre-determined area of the workpiece in an apparatus including a base containing a quantity of cement, a grid submersible in the cement and having locating means for receiving an adapter, and also including a carrier formed with a nest and mounted for movement toward and away from the grid, the sub-assembly comprising an imprinting plate, an adapter associable with the locating means and upon which the plate is fixedly mounted for positioning the plate on the grid, a work support contoured at least in part to match the workpiece and thereby to provide a target for positioning the workpiece and a panel upon which the work support is fixedly mounted, the panel being receivable in the nest to align the work support in register with the imprinting plate when both the work support and the plate are in imprinting relationship whereby a different subassembly is employed for each workpiece contour and cement pattern.

8. A manually actuated apparatus for imprinting a pattern of cement upon an irregularly shaped workpiece, comprising a base containing a quantity of cement, an imprinting plate normally submerged in the cement and shaped to apply a pattern of cement only to a pre-determined area of the workpiece when the plate is raised out of the cement to an imprinting position, a carrier hinged directly upon the base, a work support fixedly mounted on the carrier and contoured at least in part to match the contour of the workpiece to provide a target for establishing a pre-determined position for the workpiece, the carrier being manually movable between a loading position for the work support and an imprinting position in which the workpiece is brought into contact with cement carried by the plate in its imprinting position, vacuum means for retaining the workpiece on the work support and means interconnecting the carrier and the plate for causing the plate to be raised out of the cement to its imprinting position solely from the manual pivotal movement of the carrier bringing the work support to its imprinting position.

9. Apparatus according to claim **8** further comprising a lid normally covering the cement in the base and means interconnecting the carrier and the lid to raise the lid out of the way as the work support approaches, the movement of the lid being actuated solely from the manually actuated movement of the carrier.

10. Apparatus according to claim **8** further comprising a valve on the carrier controlling the vacuum to a low level permitting the placement of the workpiece on the work support in the loading position, the valve being closed by the displacement of the carrier from the loading position to raise the vacuum level for retaining the workpiece securely on the work support.

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